NOTES ON NEOTROPICAL EUPHORBIACEAE

4. Monograph of the genus Actinostemon

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ACTINOSTEMON Klotzsch

in Wiegemann, Arch. Naturg. 7: 184. 1841; Benth. in Benth. et Hooker f. Gen. 3: 338. 1880; Pax et K. Hoffm. in Pflanzenr. Heft 52: 57. 1912.
Dactylostemon Klotzsch, Arch. Naturg. 7: 181. 1841
Gussonia Spreng., Neue Entdeckungen 2: 119. 1821 ex parte

TYPE SPECIES: Actinostemon concolor (Spreng.) Müll. Arg.

Arbores vel frutices glaberrimi vel glabrescentes foliis margine semper integerrimis in apice ramulorum spurie verticillatis vel sparsis.

Racemi e gemmis strobiliforme imbricatis dein deciduis orientes, squamis glumaceis coriaceis dorso costatis, brunneo-purpureis margine ciliatis.

Inflorescenciae spicae cymuliferae basi flores ♀ 1-3 dein cymulas ♂ numerosas gerentes.

Flores ♂ sepalis valde reductis vel nullis. Stamina indefinita, filamenta libera apice saepe in phalanges 3-8 staminiferas divisa ex uno centro oriente divergentia. Pedicelli filamentis simillimi in floribus nudis ab eis vix distincti nil nisi rudimentis sepalis 1-2 vel eis absentis divisio inter pedicellum et filamentum geniculo tantum notata. Flores in cymulo intermedio staminas plus quam in cymulos laterales praebens.

Flores ♀ basi spicae solitarii vel pauci saepe longius pedicellati. Sepala basi ovarii adpressi vel nulli. Styli liberi vel in columnam connati. Ovarium fusiforme, subglobosum vel late discoideum, laeve vel tuberculatum.

Capsula in coccos 2-valves dissiliens dorso carpidiorum armata vel laevis, columella trialata persistens.

Semina subglobosa carunculata, embryo in albumine horizontalis vel verticalis.

Plate I

Geographic Distribution of Actinostemon

The geographic distribution of Actinostemon is distinctly neotropical. Nowhere does it cross the tropic of Cancer and only the tropic of Capricorn is crossed slightly south of São Paolo by A. concolor and A. concepcionis. The area of main distribution lies along the eastern margin of South America between Pernambuco and Paraguay (with 9 species). Four endemic species have four very isolated occurrences: one in Acre and Upper Amazonas (12), one in the Roraima area (7), one in western Cuba (3), and one in the Antilles and northern Venezuela (2).

Plate I


Distribution of Actinostemon
4 unciformis
5 angustifolius
8 klotzschii
9 lundianus
10 appendiculatus
11 verticillatus
13 echinatus
3 brachypodus
2
2 caribaeus
7
7 schomburgkii
9
8
12 amazonicus
12
1
1
10
13
4
8
1 concolor
10
9
6 concepcionis
5
10
10
6
6
9
13
11
8
MILES
0
1000
2000
Drawn by C. C. Clare

NOTE: The strobilaceous tegmentum enclosing the undeveloped inflorescence is very conspicuous and a good character of the genus. When later the inflorescence develops, the tegmentum falls off and the genus is less easily identifiable. Because of the conspicuous character of the young tegmentum most collectors collect the specimen at this stage. A great number of collections, therefore, are unsuitable for specific identification.

This genus first appeared in the literature in 1821 under the name Gussonia Sprengel. This name, however, had to be dropped because it became confused by the fact that Sprengel included into it right from the start Sebastiania, a very different genus, and worst of all Sprengel's diagnosis does not cover Actinostemon correctly. As Pax puts it (l.c. 79): "descripcio Sprengeliana cum diagnosi generis haud quadrat."

In 1841 Klotsch introduced two names simultaneously: Dactylostemon and Actinostemon to cover this genus. Klotsch claimed that Dactylostemon has a good developed ? calyx and capsules with protuberances, whereas Actinostemon is lacking these. Müller Arg. in 1866 has added to these characters a further distinction claiming the embryo in Dactylostemon is horizontal and in Actinostemon vertical.

In 1912 Pax concluded that these distinctions cannot be maintained. He selected Actinostemon for the name of the genus and relegated Dactylostemon to synonymy.

After 1841 the number of species slowly increased through the work of Didricksen, Grisebach (1857) and Klotzsch (1862) and then rapidly through Müller of Argau (1863, 1866, 1874). Müller was the creater of many new binomials (18) and a flood of tri- and quadrinomials (52) based on very weak evidence, on poor material and often on one single specimen.

O. Kuntze in 1891 (Rev. Gen. 2: 606) following rigid priority revived the name Gussonia and retransferred 21 Actinostemon binomials to Gussonia. Only four of these binomials remain today in the genus; the rest are synonyms of these or do not belong to Actinostemon at all.

Pax in the Pflanzenreich 1912 has reduced many of Müller's bi-, tri- and quadrinomials but was too much of a follower of Müller and was far too little critical in his revision. He has recognized 29 species plus 4 dubia. Seven more binomials were added since 1912, increasing the total to 40.

In the present revision I have accepted of these only 11, but added two new species, bringing the total to 13.

Two distinct evolutionary trends can be discerned within the Hippomaneae. One goes from Sapium through Sebastiania to Stillingia culminating in the development of a gynobase. The other starts with Senefeldera, goes through Gymnanthes and culminates in Actinostemon. In this evolution the calyx becomes reduced step by step to nil, and this loss is compensated by the development of a peculiar protection in the form of a strobiliform tegmentum which encloses the young inflorescence completely.

Another characteristic feature in these two parallel trends (Sebastiania and Actinostemon) is the evolution of appendices and protuberances on the ovary and horns and thorns on the capsules. This development, however, often reverses itself, and the protuberances so conspicuous on the young ovary become reduced and often disappear entirely on the ripe capsule.

CLAVIS SPECIERUM ACTINOSTEMONIS

1. Carpidia inermia vel geminatim bituberculata
   2. Folia in ramulis subaequaliter sparsa
      3. Ovarium inerme glabrum
         4. Ovarium fusiforme calice destitutum apice in columnam ovario leviter tenuiorem abeunte. Columna stylaris 1 cm longa, capsula pedunculo 2-3 cm longo elevata
            5. Flos intermedius cymuli ♂ 5-11 andrus. Brasilia austro-orientalis, Paraguay, Misiones.....1. concolor
            5. Flos intermedius cymuli ♂ 4-andrus
               6. Folia oblonga 10 cm longa. Antilles, Venezuela.....2. caribaeus
               6. Folia elliptica, basi rotundata 3-5 cm longa. Cuba occidentalis 3. brachypodus
         4. Ovarium subglobosum, styli liberi elongati circum ovarium uncinato-deflexi, pedicelli ♀ breviusculi 6-8 mm longi, calyx ♀ evolutus. Bahia 4. unciformis
      3. Ovarium armatum 6-gibbosum vel cristato-appendiculatum
         7. Flos intermedius cymuli ♂ 8-15-andrus, ovarium 6-gibbosum
            8. Ovarium glabrum, folia lanceolata 10-12 cm longa 1-4 cm lata. Rio de Janeiro 5. angustifolium

8. Ovarium vestitum, folia ovata parva 3.5-7.0 cm longa infra medium latissima. Paraguay, S. Paulo...6. concepcionis
7. Flos intermedius cymuli ♂ 4-8 andrus
9. Ovarium leviter 6-gibbosum, folia minora 3-5 cm longa 1.5-2 cm lata. Guayana.....7. schomburgkii
9. Ovarium grosse cristato-appendiculatum, folia magnitudine variabilia 3-12 cm longa 1.5-4 cm lata. Rio de Janeiro, Maranhão.....8. klotzschii

2. Folia apice ramulorum congesta
10. Styli in columnam connati
11. Ovarium inerme vel leviter tantum 6-tuberculatum. Bahia, Minas Geraes, Rio de Janeiro.....9. lundianus
11. Ovarium grosse cristato-appendiculatum, flos intermedius cymuli ♂ 10-15 andrus pedicello 2-3 mm longo elevatus, androeceum capituliforme. Pernambuco, Espiritu Santo, Bahia.....10. appendiculatus
10. Styli liberi vel imo basi tantum connati, ovarium lurido-hirsutum
12. Carpidia inermia vel obscure 2-tuberculata, flos intermedius cymuli ♂ 3-8-andrus. Bahia, Minas Geraes, Rio de Janeiro 11. verticillatus
12. Carpidia distincte 2-tuberculata, flos intermedius cymuli ♂ 8-12-andrus. Acre, Amazonia Brasiliensis 12. amazonicus

1. Carpidia muricata nec bituberculata. Rio de Janeiro, Pernambuco.....13. echinatus

1. ACTINOSTEMON CONCOLOR (Spreng.) Müll. Arg. in DC. Prodr. 15, 2: 1193. 1866
Gussonia concolor Spreng., Neue Entdeck. 120. 1821
Excoecaria concolor Spreng., Syst. 3: 24. 1826
Actinostemon sessilifolius Kl. in Linnaea 25: 297. 1852
Actinostemon multiflorus Müll. Arg. in Linnaea 32: 111. 1863
Actinostemon oligandrus (Müll. Arg.) Baill. Adansonia 5: 335. 1863
Actinostemon polymorphus Müll. Arg. in Linnaea 32: 108. 1863
Actinostemon macrocarpus Müll. Arg. in Mart. Fl. Bras. 11, 2: 597. 1874

Actinostemon sparsifolius (Müll. Arg. Pax in Pflzr. Heft 52: 72. 1912
Actinostemon cantagallensis Glaz. Bull. Soc. Bot. Fr. 59: 634. 1913 (nomen)
Actinostemon tortuosus Glaz. l.c. 1913 (nomen)
Dactylostemon oligandrus Müll. Arg. in Linnaea 32: 115. 1863
Dactylostemon sparsifolius Müll. Arg. in Mart. Fl. Bras. 12, 2: 610. 1874
Gymnanthes concolor Müll. Arg. in Linnaea 32: 103. 1863
Stillingia concolor Baill. Adansonia 5: 327. 1865

TYPE COLLECTION: None.

DISTRIBUTION: On the eastern margin of South America, between Pernambuco and Paraguay.

SPECIMENS EXAMINED:
Pernambuco: Nazare da Mata, Jayme Coelho de Moraes 1099 (US)
Ceara: Serra do Bezouro, Guedes 471 (NY)
Bahia: Prope Bahiam (Tulasne sen.) Blanchet 9788 (NY)
Forest of Rio Grungogy Basin, Curran 246 (US)
Minas Geraes: (Tulasne) Claussen 742 (A, A, NY)--Type of A. oligandrus
Photo Delessert, Claussen s.n. (GH)
Teixeira Soares, A. Sampaio 825 (US)
Gardner 5175 (US, NY, V).--Type of var. gardneri
Lagoa Santa, Warming 1601 (GH) Photo Copenhagen (C).--Type of A. sparsifolius
Rio de Janeiro: mostly without exact locality
Duarte 5186 (US)
Gardner 172 (V); 5620 (GH); 5822 (V, V, V, US)
Glaziou 1465 (US, F); 3106 (US); 9578 (US); 9580 (F) (nomen).--Type of A. tortuosus; 16347 (F); 16354 (F).--Type of A. cantagallensis (nomen); 18470 (US)
Hoehne-Kuhlman 25070 (NY)
Langsdorf s.n. (US)
Lund (hb. Warming) (NY)
Pabst 5409 (US)
Pereira 110 (US); 4080 (7006) (US); 7100 (US)
Pohl 1717 (GH, NY, MO).--Type of A. multiflorus
Riedel s.n. (GH, GH, GH, GH, NY, NY, NY, MO)
Riedel s.n. photo of Type of A. macrocarpus (V, V, V, V, US, US, US)
Saint Hilaire 976 (NY)
Schott 4202 (V, V); 4654 (V, V); 4655 (V, V); 1717^{d} (GH, F)
Sello s.n. (V, V, V)
Vauth (herb. Endl.) (V)
Wilkes s.n.
Collector ? (herb. Warming) (GH)

São Paulo:
Sao Luiz do Parahytinga, Löfgren & Edwall 1859 (A)
Bosque da Saude, Hoehne 4354 (NY)
J. Weir 303 (F)
Iguape, Pirassununga, Löfgren & Edwall s.n. (A)
Parque de Estado, O. Handro 28.131 (A, A)
Parana:
Maringo, Orto Forestal, Hatschbach 12.936 (US)
Pinheirinho (Antonina), Hatschbach 14.751 (US)
Guaratuba, Pedra Branca de Araraguara, Hatschbach 14.525 (US)
Serra do Mar, Porto de Cima, Jonsson 954[a] (A, F)
Villa Velha, in campo rupestri 875 m, Jonsson 1151a
Ponta Grossa, in sylvula, Dusen 10.304 (NY, US, GH, F, MO)
Jaguarinhyva, 740 m, Dusen 13.091 (G, H)
Villa Velha, in sylvula, Dusen 15.697 (A, MO)
Santa Catarina:
Klein 55 (US, US, US); 149 (NY); 597 (US); Klein 805 (US, NY, F); 1582 (US, NY); 1612 (US); 1635 (US, NY); 2281 (US, NY); 3006 (NY)
Reitz 1852 (US, NY); 2807 (F, NY); 3080 (US)
Reitz & Klein 3830 (NY); 4687 (US); 6927 (F); 7018 (US); 7030 (US, US, NY, GH); 7045 (US); 9039 (US); 9118 (F); 9318 (NY); 16236 (US); 16261 (US)
Smith-Klein-Gieweski 7606 (US, NY)
Smith-Reitz 12905 (GH, MO); 12513 (F); 12932 (NY)
Ule 939 (US)
Luederwald 13843 (A)
Rio Grande do Sul:
Estacão Linha Bonita, Rambo 40.019 (F, V)
Estacão Azevedo, Rambo 43.302 (F, V)
Capesberg prope Caxias, Rambo 43.387 (F, V)
Portão prope S. Leopoldo, Rambo 43.534 (MO, V)
Morro do Sabia, prope Porto Alegre, Rambo 43.739
Neu Wurtenberg, Bornmuller 536 (V, GH)
Canoas prope Porto Alegre, Malme 290 (US, GH); 1472 (US, GH)
Mo da Gloria--Porto Alegre, Rambo & Andinata 117 (US)
Uruguay:
Tacuari, Dept. Treinta y Tres, Herter 1806 (V, F, GH, MO, NY, US)
Argentina, Misiones:
Salto Iguazu, Rodriguez (388) 3548 (GH); 10976 (GH
Iguazu Eldorado, Schwindt 2106 (V)
Cercanias del Piray-Guazu, Schwindt 2010 (MO)
Acaragua, Dept. San Javier, Bertoni 2892 (MO, F)
Candelaria, Coreto, Montes 148 (V)
Paraguay:
Sierra de Amambay, Pedro Juan Caballero, Rojas 6407 (A)
Cerro Torin, Rojas 3897 (A)
Sierra de Amambay, Hassler 11278 (A, NY, V)

Paraguay (continued):
Ibytimi, Paretti & Rojas 9703 (A)
Vista Alegre, Rojas 3885 (A, A, US)
Lacus Ypacaray, prope Sapucay, Hassler 11834 (US, A, GH, F, F, NY, MO)
Villa Rica, Hassler 8866 (V, F, NY, A)
Villa Rica, Jorgensen 3981 (GH)
Colonia Independencia, Rojas 4856 (NY, A, A, US); 14,569 (V)
Alto Parana, Fiebrig 6143 (US, GH)
Puerto Bertoni, Alto Parana, Rojas 8202 (A)
Tacuru Pucu, Alto Parana, Fiebrig 6681 (A)
Iturbe del Guaira, Montes 15.817 (V)

NOTE: Actinostemon concolor has been split by Müller to a great number of trinomials of doubtful value. He admitted himself that these were "formae varietatum nominis haud dignae." In the following I am trying to reconstruct the nomenclatural circus created by the avalanche of these tri- and quadrinomials:

In 1863 Müll. Arg. (in Linnaea 32: 108-110) listed 11 trinomials and 9 quadrinomials under Actinostemon polymorphus.

In 1866 (DC. Prodr. 15, 2: 1193-5) he transferred all these to A. concolor (Spreng.) Müll. Arg., increasing their number to 12 by adding one by reducing A. caribaeus Griseb. to a trinomial status. He further complicated the picture by changing var. angustatus to var. angustifolius, var. gardneri to var. genuinus, var. acutissimus to var. acuminatus. He also changed one quadrinomial: f. minor to f. sessilifolius (Kl.) Müll. Arg., and dropped 7 quadrinomials, retaining unchanged only one: f. platyphyllos

In 1874 (Mart. Fl. Bras. 12, 2: 593-597) he further increased the number of trinomials from 12 to 17 by adding a new one (var. riedelii), by reviving and elevating 5 quadrinomials to 4 varieties (f. microphyllus to var. microphyllus, f. latifolius to var. gardneri, f. bicolor to var. bicolor, f. angustifolius lumped with f. biattenuatus to var. genuinus). At the same time he dropped without trace: f. concolor and f. cuspidatus.

In 1912 Pax (Pflzr. Heft 52 Hippomaneae: 75-79) made an attempt to save 10 of Müller's 17 trinomials but let the two last quadrinomials (f. platyphyllos and f. sessifolius) die their natural death.

2. ACTINOSTEMON CARIBAEUS Griseb. in Abh. Ges. Wiss. Göttingen 7: 168. 1857
Actinostemon concolor var. caribaeus Müll. Arg. in DC. Prodr. 15, 2: 1193. 1868

Actinostemon sessilifolius Kl. in Linnaea 25: 297. 1852 ex parte
Excoecaria caribaea Griseb. Fl. Brit. Westind Isl. 51. 1864

TYPE COLLECTION: Antigua, Wullsohl (V)

DISTRIBUTION: Lesser Antilles, Northern Venezuela

SPECIMENS EXAMINED:
St. Martin: Boldingh 3143 (NY)
Antigua : Wullschlagel 514 (V)
Rose-Fitch-Russell 3477 (NY)
Harold E. Box 1106 (NY, MO)
Guadeloupe: Duss 2465 (NY, NY, US, F, GH, MO)
Griseb. ded. 1857 (MO)
H. Stehle 81 (US); 5646 (US)
Dominica : Hodge & Hodge 2684 (GH)
Martinique: Duss 891 (NY)
Barbados : Gooding 423 (NY)
Eggers 7149 (US)
Trinidad : Sieber s.n. (V)
Venezuela :
Estado Falcon: Peninsula Paraguara, Cerro Santa Ana, Steyermark & Brown 94631; Tamaga 699 (Ven); Breteler 4294 (Ven); Lasser & Aristeguita 3411 (Ven)
Estado Yaracuy: Near Tania, Steyermark 56858 (NY, NY, F)
Estado Carabobo: Guaremales, road from El Palito to San Felipe, Pittier 8847 (NY, GH, Ven, US)

3. ACTINOSTEMON BRACHYPODUS (Griseb.) Urban in Fedde, Rep. Spec. Nov. 28: 231. 1930; Bro. Alain, Fl. de Cuba 3: 120. 1953
Excoecaria brachypoda Griseb. in Nachrichten Gesellsch. Wiss. Göttingen 178. 1865
Excoecaria brachyandra Müll. Arg. in DC. Prodr. 15, 2: 1224. 1866
Gymnanthes brachypoda (Griseb.) Pax & Hoffm. Pflzr. Heft 52: 1912

TYPE COLLECTION: C. Wright 2005, Prov. Pinar del Rio prope Vinales in sylva humili Sierra de Vinales ad Ensenado de la Bandera, Cuba occidentalis. "Obs. Jam cl. Müller Arg. hanc speciam recte ad Actinostemon traduxerat sed infauste cum specie ex Antillis minoribus conjunxit, que foliis oblanceolatis vel ellipticis inferne longe cuncatis angustatis facile distinguenda est" (Urban).

DISTRIBUTION: Endemic in western Cuba.

SPECIMENS EXAMINED:
Pinar del Rio, Cuba occidentalis
In woods Rebiro, Wright 2005 (NY, GH, US, MO)
Guabinacho, El Rangel, slope of Loma, Fr. Leon 14048 (NY, NY, GH)
Sierra de Linares, Fr. Leon 5120 (NY, GH)
Vinales in low forest at the ascent of Sierra Vinales called Ensenada de la Bandera, Ekman 16562 (US)
Sierra del Sitio Santo Tomas in limestone in Ensenada de Vega Cuchilla, about 500 m, Ekman 16672 (NY)
Bahia Honda, Roig & Acuna 14239 (NY)
San Diego de los Banos, Britton, Earle, Gager 6783 (NY, F, GH)
Habana: Sierra del Grillo, Madruga, Fr. Leon 6341 (NY, GH)

NOTE: Only one specimen (Wright 2005) carried male inflorescences; all others carried only female flowers or had the integuments not yet open.

4. ACTINOSTEMON UNCIFORMIS Jabl. sp. nov.

Arbor 6 metralis, foliis parvis in ramulis sparsis 4-5 cm longis 1.5 cm latis ellipticis apice subrotundatis. Spicae 3-4 cm longae basi flores ♀ 2-3 dein cymulas ♂ numerosas gerentes. Flores ♂ 3-4 andri sepalis solitarius lato suffulti. Flores ♀ calyce suffulti. Calyx 3-5 lobatus. Ovarium subglobosum inerme glabrum, styli liberi ovario duplo longiores circum ovarium uncinato-deflexi. Pedicelli breviusculi 6-8 mm longi. Fructus nondum maturi.

TYPE COLLECTION: Belem & Magalhães 614. Centro de Pesquisas do Cacau, Ceplac, Cepec, Ilheus, Bahia (NY)

DISTRIBUTION: Known only from the type collection.

5. ACTINOSTEMON ANGUSTIFOLIUS (Müll. Arg.) Pax in Pflzr. Heft 52 (Hippomaneae): 64. 1912
Actinostemon glabrescens Pax et K. Hoffm. in Pflzr. Heft 52 (Hippomaneae): 64. 1912
var. macrophyllus Pax et K. Hoffm. l.c. 65
var. acuminatus (Müll. Arg.) Pax l.c. 65
var. tenuifolius (Müll. Arg.) Pax l.c. 65
var. angustifolius (Müll. Arg.) Pax l.c. 65
Dactylostemon angustifolius Müll. Arg. in Mart. Fl. Bras. 2: 604. 1874
Dactylostemon klotzschii var. acuminatus Müll. Arg. in Mart. Fl. Bras. 11, 2: 606. 1874

Dactylostemon klotzschii var. tenuifolius Müll. Arg. in Mart. Fl. Bras. 11, 2: 607. 1874
Dactylostemon klotzschii var. angustifolius Müll. Arg. in Mart. Fl. Bras. 11, 2: 607. 1874
Dactylostemon communis var. angustifolius Müll. Arg. in Linnaea 32: 713. 1863

TYPE COLLECTION: Riedel s.n., Mandioca near Rio de Janeiro (V), Photo of Delessert herb. (MO)

SPECIMENS EXAMINED:
Rio de Janeiro:
Sello s.n. (V)
Sello 1345 (F) fragment
Glaziou 13493 Photo of Berlin type (MO, GH, NY)
Riedel s.n. (GH, NY)
Hoehne s.n. Morroda Babilonia (A)

6. ACTINOSTEMON CONCEPCIONIS (Chod. et Hassler) Hochreitinger in Bull. N.Y. Bot. Gdn. 6: 278. 1910; Pax et K. Hoffm. in Pflzr. Heft 52 (Hippomaneae): 67. 1912
Dactylostemon klotzschii var. obtusatus, heterophyllus, concepcionis Chod. et Hassler in Bull. Herb. Boiss. 2 ser. 5: 678. 1905

TYPE COLLECTION: Hassler 7431, Concepcion

SPECIMENS EXAMINED:
Paraguay:
Prope Concepción, Hassler 7431, 7308 (NY, A, MO)
Zwischen Río Apa und Río Aquidaban, Fiebrig 5050 (GH)
Sierra de Amambay, Hassler 10598 (NY, F, MO)
Sierra de Amambay, Rojas 4105 (A)
Río Tapiracuai, Dep. San Pedro: Prima vera, Alto Paraguay, Woolston 866 (US, NY)
Corros Tobati: Cerro Penitente, Fiebrig 764 (A, F)
Cordillera de Altos, Hassler 681, 701 (NY, NY, NY, NY)
Cordillera de Altos, Fiebrig 131 (F, A, GH)
Silva Atira, Hassler 1480 (NY), 3143 (F) dupl. ex. Conserv. Genevensi, Photo Berlin Hb (MO, NY, NY, NY, GH)
In regione lacus Ypacaray, Hassler 12272 (NY, MO, A, A, GH)
Cordillerita-Ibatymi, Rojas 6145 (A)
Cerro de Acabay, Rojas 3257 (A)
Parque del Jardin Botanico, Rojas 9107 (A, A, A)
São Paulo:
Alto Araras: Faz Campo, Pacifico 23651 (NY)
Botucatum, Cerradao, Edwell 4294 (A)
Itapetininga, Löfgren 218 (A)

7. ACTINOSTEMON SCHOMBURGKII (Kl.) Hochr. in Bull. N. Y. Bot. Gdn.: 298. 1910; Pax in Pflzr. Heft 52 (Hippomaneae): 68. 1912

Dactylostemon schomburgkii Klotzsch in Hook. London Jour. Bot. 2: 45. 1843

Actinostemon depauperatus Pax et K. Hoffm. in Pflzr. Heft 68. Addit. 6: 58. 1919

Actinostemon parvifolius Pittier in Bol. Soc. Venez. Cie. Nat. 5: 306. 1938-9

TYPE COLLECTION: Schomburgk 716 Br. Guiana (Holotype BM) non vidi; Schomburgk 716 (Isotype MO, F); Schomburgk s.n. Photo hb. Delassert (MO)

DISTRIBUTION: Roraima area

SPECIMENS EXAMINED:

Br. Guiana: Schomburgk 714 (F); 716 photo (MO); s.n. (MO); 939 Roraima (NY); 1273 fragment (F)

Kanuku Mt., drainage of Moku-moku, A. C. Smith 3378 (A, US, MO, F, NY)

Brazil: Rio branco, Surumu Ule 7947 (US) Isotype of A. depauperatus, im Walde der Serra Mairary 900 m.

Photo of Berlin type of Ule 7947 (NY, GH, MO)

Territorio do Roraima, Senuha, Rio Mucajai, Summit of small serra, Prance, Forero, Pena, Ramos 4214 (NY)

Venezuela: Estado Bolívar: Wooded summit of Cerro between Las Nieves on base of slopes southeast of Cerro Pichacha N of Las Nieves 45 kms N of Tumeremo, Altiplanicie de Nuria. El. 100-300 m, Steyermark 89291 (NY, NY, VEN, VEN)

Estado Bolivar: El Paraiso, 38 km al NE del caserio Los Rosas el cual esta en la carretera Upata San Felix a 17 km de Upata, L. Marcanto Berti 770 (NY)

Estado Bolívar: En los sotos de la silvas veraneras del Callao, E. Delgado 211. Holotype of A. parvifolius Pittier (VEN). Isotype (US)

NOTE: A. parvifolius is based on a specimen on which the ♀ flowers are too young, but even so the appendices are distinctly shown, that the specimen can not belong to the "section Laeves" which misled the author to distinguish it from A. schomburgkii.

8. ACTINOSTEMON KLOTZSCHII (Didr.) Pax in Pflzr. Heft 52 (Hippomaneae): 69. 1912

Dactylostemon klotzschii Didricksen in Videnskahl. Meddel. Kjobenh. 127. 1857; Müll. Arg. in DC. Prodr. 15, 2: 1197. 1866; in Mart. Fl. Bras. 11, 2: 604. 1874

Actinostemon communis Pax in Pflzr. Heft 52: 65. 1912
var. grandifolius Pax l.c. 66
var. spathulatus Pax l.c. 66
var. cordatus Pax l.c. 66
var. obovatus Pax l.c. 66
var. obtusatus Pax l.c. 66
var. weddellianus Pax l.c.
var. intermedius Pax l.c.
var. heterophyllus Pax l.c.
Actinostemon cuneatus (Müll. Arg.) Baill. Adansonia 5: 535. 1865
?Actinostemon leptopus (Müll. Arg.) Pax in Pflzr. Heft 52: 69. 1912
?Actinostemon australis (Müll. Arg.) Pax l.c. 69
?Actinostemon glaziowii Pax et K. Hoffm. l.c. 75
Actinostemon desertorum (Müll. Arg.) Pax in Pflzr. Heft 52: 70. 1912
Actinostemon sprengelii Baill. Adansonia 5: 333. 1865
Dactylostemon communis Müll. Arg. in Linnaea 32: 112. 1863
var. obtusatus Müll. Arg. l.c. 113
f. glabratus Müll. Arg. l.c.
var. weddelianus Müll. Arg. l.c.
var. hagendorfii Müll. Arg. l.c.
var. cordatus Müll. Arg. l.c.
var. petiolaris Müll. Arg. l.c.
f. obovatus Müll. Arg. l.c.
f. spathulatus Müll. Arg. l.c.
var. angustifolius Müll. Arg. l.c.
Dactylostemon cuneatus Kl in sched. ex Müll. Arg. in Linnaea 32: 114. 1863
var. latifolius Müll. Arg. l.c. 114
var. angustifolius Müll. Arg. l.c. 114
Dactylostemon klotzsch Müll. Arg. in DC. Prodr. 15, 2: 1197. 1866
var. obtusatus Müll. Arg. l.c.
var. weddellianus Müll. Arg. l.c.
var. genuinus Müll. Arg. l.c.
var. cordatus Müll. Arg. l.c.
var. petiolaris Müll. Arg. l.c. 1198
var. angustifolius Müll. Arg. l.c.
Dactylostemon klotzschii Müll. Arg. in Mart. Fl. Bras. 12, 2: 604. 1874
var. grandifolius Müll. Arg. l.c. 604
var. heterophyllus Müll. Arg. l.c. 605
var. intermedius Müll. Arg. l.c. 605
var. obovatus Müll. Arg. l.c. 606
var. spathulatus Müll. Arg. l.c. 606
var. tenuifolius Müll. Arg. l.c. 607
?Dactylostemon leptopus Müll. Arg. in Mart. Fl. Bras. 11, 2, 607. 1874

?Dactylostemon australis Müll. Arg. l.c. 608
Dactylostemon desertorum Müll. Arg. l.c. 608

TYPE COLLECTION: Brazilia, Merkel Hb. Horn (C)

DISTRIBUTION: Known with certainty only from the States of Rio de Janeiro, Bahia and Maranhão.

SPECIMENS EXAMINED:
Rio de Janeiro:
Riedel s.n. Berlin photo (NY, MO, GH), 377, 3806 as var. grandifolia
Gaudichaud 1153 (NY)
Glaziou 3649, hb. Warming (F) as var. weddelianus
F. C. Hoehne 25048, Morro de S. Joao (NY) fragment (A)
Ule 734, Stranch auf dem Morro de Nova Cintra (US)
Capt. Wilkes (GH, GH, GH)
Miers s.n. (US)
Pereira 4023, Jacarepagua: Estado Boiuma (US)
Minas Geraes: Sello s.n. fide Pax, photo Berlin Sello 1343 as Actinostemon cuneatus (NY, MO, GH)
Bahia:
"Desertum Bahiense" Martius s.n. Photo München, Type of Actinostemon desertorum
Maranhão:
Island of Sao Luiz. Froes 11593 (US, F, MO, A, NY)
St. Paul:
Burchell 5238, 4966 Photo Delessert. (MO) Type of Actinostemon australis
Brasilia without closer locality, but probably mostly from Rio de Janeiro:
Hagendorf 1347. Photo Berlin as "Actinostemon klotzschii" (GH, F, NY, MO)
Schueck s.n. Photo Vienna (MO) as Actinostemon leptopus (V)
Glaziou 16347. Photo Berlin as Actinostemon glaziovii (MO, GH, NY)
Burchell 1086 (K)
Riedel s.n. as var. grandifolius (US), as var. spathulatus (NY, US)

NOTE: Didricksen defined this species as "Ovarium...infra apicem cornubus 6 per paria dispositis e latere compressis curvulato-erectis obtusis preditum."

This character could not be verified with certainty in the following synonyms: A. australis, cuneatus, desertorum and leptopus. Pax who had opportunity to examine the pistils on the types of these synonyms describes them as "minute sed districte 6-tuberculatum," or "obtuse tuberculato-6-gibbosum" or simply as "6-gibbosum," or "dorso carpidiorum infra medium minuta et obtusa 2 tuberculatum."

9. ACTINOSTEMON LUNDIANUS (Didr.) Pax in Pflzr. Heft 52 (Hippomaneae): 70. 1912

Dactylostemon lundianus Didricksen in Vid. Medd. Nat. for Kjobenh. 126. 1857

Dactylostemon lasiocarpoides Müll. Arg. in Linnaea 32: 114. 1863

Dactylostemon lasiocarpus Müll. Arg. l.c. 111. 1863

Actinostemon estrellensis (Müll. Arg.) Pax Pflzr. Heft 52: 71. 1912

Actinostemon gardneri (Müll. Arg.) Pax Pflzr. Heft 52: 63. 1912

Actinostemon grandifolius (Müll. Arg.) Pax l.c. 61. 1912

Actinostemon lagoensis (Müll. Arg.) Pax l.c. 62. 1912

Actinostemon lanceolatus Saldanha in Adansonia 8: 263. 1867-8

Actinostemon lasiocarpoides Baill. Adansonia 5: 334. 1865

Actinostemon lasiocarpus (Müll. Arg.) Baill. Adansonia 5: 334. 1865

Actinostemon mandiocanus (Müll. Arg.) Pax Pflzr. Heft 52 (Hippomaneae): 61. 1912

TYPE COLLECTION: W. Lund s.n. hb. Horn (C) non vidi. However Didricksen's description leaves no doubt about the identity of this species. "A genere diversa in primis cornuum defectu."

DISTRIBUTION: Bahia, Minas Geraes and Rio de Janeiro. Recently discovered in the Territorio Amapa.

SPECIMENS EXAMINED:

Bahia:

Inter Bahiam et Vittoriam. Sello s.n. in hb. Berol. non vidi. Type of Actinostemon lasiocarpus Müll. Arg. in Linnaea 32: 111. 1863

Prope Nazare. Sello 1349 photo of Berlin type of A. grandifolius (MO, NY, GH)

Minas Geraes:

Lagoa Santa, Warming 1061 photo of Copenhagen type of A. lagoensis (F, GH)

Vicosa, El. 700 m, road to Sao Miguel, Ynes Mexia 5198 (MO, MO, F, NY, A, GH, US, US)

Distr. Iltien, Fazenda da Tabunha El. 300, Ynes Mexia 4987 (MO, F, NY, GH, A)

Rio de Janeiro:

Parahyba do Sul dans la foret du Macao. Saldanha (285) 5490 photo of Berlin type of A. lanceolatus (NY, MO, GH)

Fazenda do Sobrol, inflor. not yet open, Glaziou 13179 (F, NY, NY, MO, GH, US)

Mandioca, photo of Delessert type of A. mandiocanus Riedel et Lansdorff 556 (MO)

Rio de Janeiro (continued):
Without exact locality Schott 4653. Pohl 1714 (F)
Prope Rio de Janeiro, Typus of A. gardneri. Gardner 166 (V, NY) Photo of Vienna Typus (MO, GH) Photo of Geneva Typus (NY, MO)
Corcovado, Riedel 378, photo of Types of Dactylostemon lasiocarpoides (GH, MO, NY) without detail, Riedel s.n. (GH, GH, US, NY)
Aldeida de S. Pedro, Glaziou 13177 (NY, GH)
Entre Lago de Deixo et la Rio Bonita, Typus of Actinostemon extrellensis, Glaziou 13178 (F, US)
Terr. Amapa:
Rio Araguari, 5 hours above Rio Muruni, 1°24' N--51°57' W, Pires, Rodrigues, Irvine 50447 (NY). Fruits only. Unicate.
Rio Araguari, vicinity of Camp 12, 1°11' N--52°8' W. Pires Rodrigues, Irvine 51437 (NY, NY, NY, NY)
Male part of inflorescence slipping out, ♀ not yet out.

10. ACTINOSTEMON APPENDICULATUS Jabl. sp. nov.
Arbor heterophyllus foliis nitidis brevissime petiolatis ternatim quinatimque verticillatis, oblanceolatis basin versus cuneato angustatis ima basi saepe brevissime subcordatis 9-13 cm longis 2-4.5 cm latis superiore parte latissimis.

Squamae involucrantes more generis brunneae striatae margine ciliatae florendi tempore caducissimae, spicae 2-3 cm longae basi flores ♀ 1-3 dein cymulas ♂ numerosas gerentes, cymulae basales hinc inde juxta florem ♀ utrinque flores ♂ gerentes.

Stamina floris ♂ intermedii 9-15, reliquorum 7-12 basi glandulosa, pedicelli graciles 2-3 mm longi, calyx ♂ omnis deficiens, anthereae fere sessiles capitulum formantes.

Pedicelli ♀ breves fere crassi, 2-3 mm longi, sepala exigua lanceolata glabra vel sparse hirsuta, ovarium glabrum vel sparse hirsutum duplo latius quam altum grosse cristato-6-appendiculatum, appendices sub anthesin divaricati dein apicem versus vel introrsum falcati, styli sub anthesin in columnam brevem post antherin longiorem 2-5 mm longam connati, stigmata longa circinatim involuta.

Capsula glabra 7 mm alta 9 mm diametiens appendicibus subalatis 6-cornuta.

TYPE COLLECTION: Jayme Coelho de Moraes 1091 Nazare da Mata, Pernambuco (US)

DISTRIBUTION: Northeastern Brazil between Pernambuco and Espiritu Santo and possibly Rio de Janeiro.

SPECIMENS EXAMINED:
Pernambuco:
In woods Tapera. Pickel 3467 (GH, NY, F) 3530 (GH, NY, F)
Bahia:
Forest Grungogy. Curran 163 (US)
Espiritu Santo:
Itabapoana. Sampaio 946 (US)
Rio de Janeiro:
Schott 4652 (F)

11. ACTINOSTEMON VERTICILLATUS (Kl.) Baill. in Adansonia 5: 334. 1865
Dactylostemon verticillatus Klotzsch in Linnaea 25: 298. 1852
Actinostemon verticillatus Baill. f. genuinus Müll. Arg. in Mart. Fl. Bras. 11, 2: 603 tab 83 f. 1. 1874
Actinostemon verticillatus f. subinermis Müll. Arg. l.c. 603. 1874

TYPE COLLECTION: None. "Frutex brasiliensis ramosissimus" (Klotzsch described a plant grown in Berlin Bot. Gdn.)

DISTRIBUTION: Bahia, Minas Geraes, Rio de Janeiro.

SPECIMENS EXAMINED:
Bahia:
Forest of Grungogy, Curran 24 (GH, US); 198 (US); 246 (GH) ♀ flowers not yet unfolded.
Minas Geraes:
Lagoa Santa, Warming s.n. (GH)
Rio de Janeiro:
Morro do Babilonia. Hoehne s.n. (A)
Gaudichaud 1146 (NY, A, F) non nisi capsula
Glaziou 3815 (F)
Riedel 381 (US, GH, NY)(Typus of f. subinervis)
Aug. St. Hilaire 297 (F) Capsula glabra laevis

12. ACTINOSTEMON AMAZONICUS Pax et K. Hoffm. in Pflzr. Heft 52 (Hippomaneae): 63. 1912

TYPE COLLECTION: Ule 5586 Jurua Miry. Acre, Brazil (V). Photo of Berlin type (MO, NY, GH)

DISTRIBUTION: Very limited to Acre and the southwestern edge of Amazonas bordering to Acre.

SPECIMENS EXAMINED:
Acre:
Rio Purus: Rio Yaco, R. Macauhan, Krukoff 5551 (NY, A)
Amazonas:
Jurua, Embira (Rio Tarauca) 7°30' 70°15' Krukoff 4751 (MO, NY, A)

NOTE: In all specimens seen the involucrant scales enclose the inflorescence to such an extent that nothing is shown from the flowers. According to Pax and Hoffmann's description Actinostemon amazonicus is closely related to Actinostemon verticillatus and differs from it only in the number of stamens which is 8-12 in the intermediate flower of the cymule of A. amazonicus, and only 3-8 of A. verticillatus.

13. ACTINOSTEMON ECHINATUS Müll. Arg. in Linnaea 32: 107. 1863
Actinostemon echinatus var. major Müll. Arg. l.c. 108.
Actinostemon echinatus var. minor Müll. Arg. l.c. 108.
Actinostemon echinatus var. spathulatus Müll. Arg. l.c. 108.
Actinostemon echinatus var. obovatus Müll. Arg. in Mart. Fl. Bras. 12, 2: 592. 1874
Actinostemon trachycarpus Müll. Arg. in Mart. Fl. Bras. 12, 2: 591. 1874

TYPE COLLECTION: Gaudichaud 1145, prope Rio de Janeiro Photo ex Delessert Hb. (MO), fragment of type (F)

DISTRIBUTION: Besides the type locality of Rio de Janeiro collected in Pernambuco

SPECIMENS EXAMINED:
Rio de Janeiro:
Gaudichaud 1145 fragment (F) photo (MO)
Pernambuco:
Schorbaum s.n. Photo ex hb. Delessert (MO)

NOTE: Poorly known species. The echinate capsule distinguishes it from all other Actinostemon. The flowers are known only from Müller's and Pax et K. Hoffm. description.

Plate II

Actinostemon brachypodus Urb.

A. Fruiting branchlet x 1 (Ekman 16.672)

B. Branchlet with ♀ flower x 1 (Leon 14.048)

C. Branchlet with ♂ spike x 1 (Wright 2.005)

Plate II

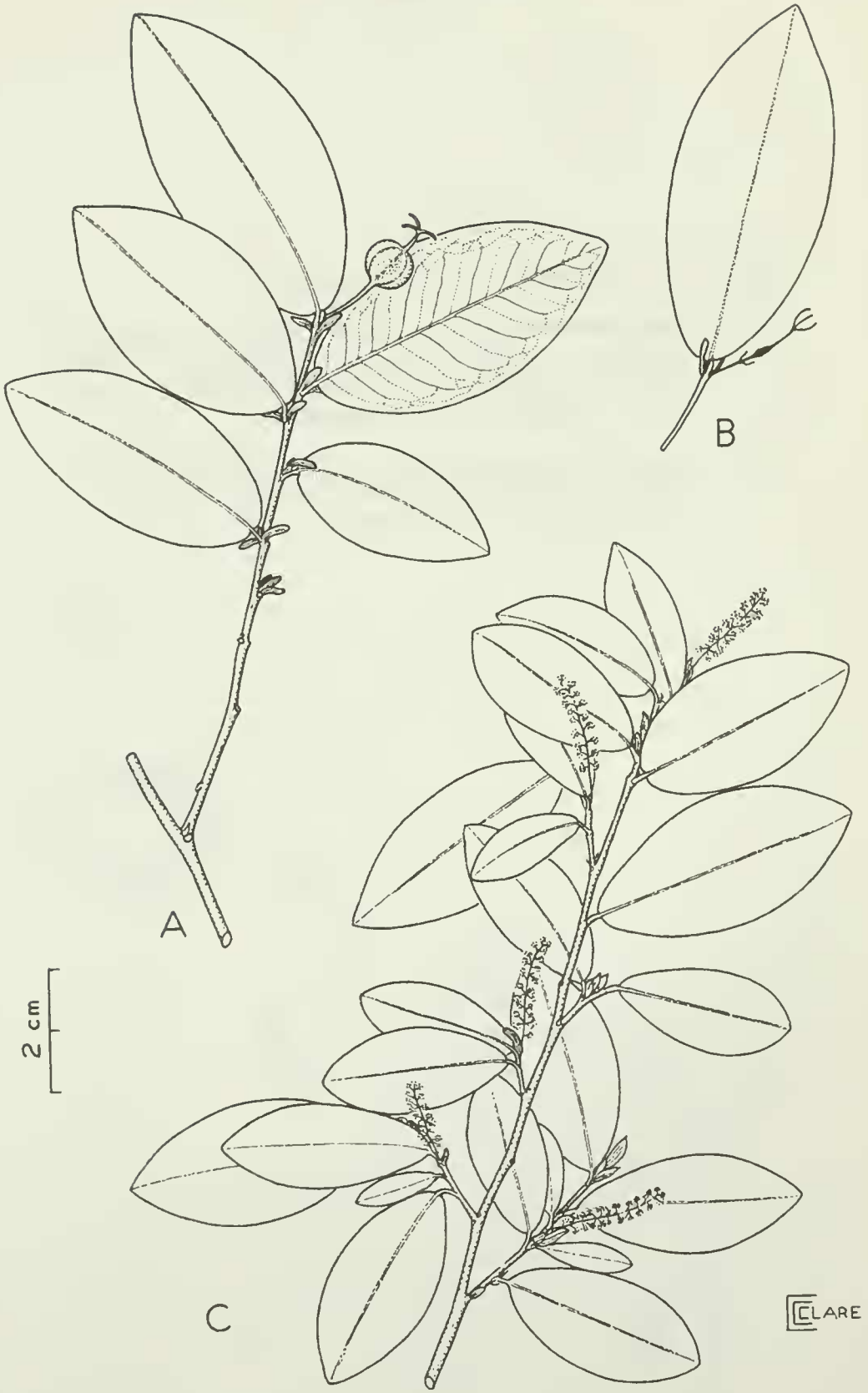

Plate III

Actinostemon lundianus (Didrichs.) Pax

A. Spike emerging from the strobiliform tegmentum, exposing the rich ♂ part of inflorescence. The ♀ flowers usually at the base of the spike have not yet emerged from the tegmentum.

B. Branchlet showing verticillate arrangement of 3 leaves and the inflorescence in an advanced fruiting stage of development.

Plate III

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var. angustifolius (Müll. Arg.) 1863	(8)
var. latifolius Müll. Arg. 1863	(8)
depauperatus Pax & K. Hoffm. 1919	(7)
desertorum (Müll. Arg.) Pax (1874) 1912	(8)
echinatus Müll. Arg. 1863	(13)
var. major Müll. Arg. 1863	(13)
var. minor Müll. Arg. 1863	(13)
var. obovatus Müll. Arg. 1874	(13)
var. spathulatus Müll. Arg. 1863	(13)
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f. cuspidatus Müll. Arg. 1863	(1)
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var. gardneri Müll. Arg. 1863	(1)
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f. biattenuatus Müll. Arg. 1863	(1)
f. latifolius Müll. Arg. 1863	(1)
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var. grandifolius Müll. Arg. 1863	(1)
var. intermedius Müll. Arg. 1863	(1)

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var. longifolius Müll. Arg. 1863 (1)
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ACTINOSTEMON (NOMINA NUDA)

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hagendorfii Kl. 1841 (nomen)

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var. obtusatus Chod. et Hassler 1905	(6)
var. petiolaris Müll. Arg. 1863	(8)
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mandiocanus Müll. Arg. 1874	(9)
obtusatus Kl. 1841 (nomen)	(8)
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oligandrus Müll. Arg. 1863	(1)
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var. genuinus Müll. Arg. 1874	
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GUSSONIA Spreng. 1821

concolor Spreng.	(1)
discolor Spreng.	Sebastiania discolor (Spreng.) Müll. Arg.
serrulata Mig. 1847 Linnaea 19	Sebastiania gaudichaudii Müll. Arg.

Gussonia O. Ktze.
Rev. gen. 2: 604-606. 1891.

O. Kuntze summarily transferred all Actinostemon on grounds of strict priority disregarding the fact that the name Gussonia was untenable on other grounds.

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